

# Chapter Seven Measuring Aggregate Economy

**Chapter 7**

Measuring the Aggregate Economy

McGraw-Hill/Irwin Colander, Economics 1

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**Chapter Goals**

- Define GDP and identify the four expenditure components of aggregate output
- Calculate GDP in a simple example, avoiding double counting
- Distinguish between "net" and "gross" and between "national" and "domestic"
- List the four components of aggregate income

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**Chapter Goals**

- Explain how profit is key to the equality between aggregate income and aggregate production
- Distinguish between real GDP and nominal GDP
- Discuss the shortcomings of using GDP

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### Aggregate Accounting

- **Aggregate accounting** (or national income accounting) is a set of rules and definitions for measuring economic activity in the aggregate economy – that is, in the economy as a whole
- Aggregate accounting is a way of measuring total, or aggregate production
- **Gross domestic product (GDP)** is the total value of all final goods and services produced in an economy in a one-year period

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### Calculating GDP

- Calculating GDP requires adding together millions of different services and products
- All of the quantities of goods and services produced are multiplied by their market price per unit to determine a value measure of the good or service
  - This is weighting the importance of each good by its price
- The sum of all of these values is GDP

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### The Components of GDP

GDP is divided into four expenditure categories:

1. **Consumption (C)** is spending by households on goods and services
2. **Investment (I)** is spending for the purpose of additional production
3. **Government spending (G)** is goods and services that the government buys
4. **Net exports (NX)** is spending on **exports (X)** minus spending on **imports (M)**

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### The Components of GDP

- Since all production is categorized into one of these four divisions, by adding up these four categories, we get total production of U.S. goods and services

$$\begin{aligned} \text{GDP} &= \text{Consumption} \\ &\quad + \text{Investment} \\ &\quad\quad + \text{Government spending} \\ &\quad\quad\quad + \text{Net exports} \\ \text{GDP} &= C + I + G + (X-M) \end{aligned}$$

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### Expenditure Breakdown of GDP

Country	GDP (billions \$)	= C (%)	+ I (%)	+ G (%)	+ X (%)	- I (%)
U.S.	\$14,265	71	14	20	13	-20
Belgium	376	51	23	23	89	-86
Czech Republic	248	47	38	20	70	-75
Germany	2,928	55	18	18	47	-41
Japan	4,294	55	25	18	18	-16
Mexico	1,480	66	26	10	28	-30
Poland	609	60	26	18	41	-45

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### GDP is a Flow Concept

- GDP is a *flow* concept, the amount of total final output a country produces per year
- **Wealth accounts** is a balance sheet of an economy's assets and liabilities and it is a *stock* concept
- **Real wealth** is the value of the productive capacity of the assets of an economy measured by the goods and services it can produce now and in the future
- **Nominal wealth** is the value of those assets measured at current market prices

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**Go To GDP 1 Powerpoints**

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**GDP Measures Final Output**

- GDP does not measure total transactions in the economy
- It counts final output, but not intermediate goods
  - **Final output** is goods and services purchased for final use
  - **Intermediate products** are used as an input in the production of some other product
- Counting the sale of both final and intermediate goods would result in double counting

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**Two Ways of Eliminating Double Counting**

- Calculate only final output
  - A firm would report how much it sold to consumers and how much it sold to producers (intermediate goods)
- Follow the value added approach
  - **Value added** is the increase in value that a firm contributes to a product or service
  - It is calculated by subtracting intermediate goods (the cost of materials that a firm uses to produce a good or service) from the value of its sales

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### Value Added Approach

Example: Ice cream production

Participants	Cost of Materials (\$)	Value of Sales (\$)	Value Added (\$)
Farmer	0	100	100
Cone factory and ice cream maker	100	250	150
Middleperson (final sales)	250	400	150
Vendor	400	500	100
<i>Totals</i>	750	1,250	500

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### What is Counted in GDP?

Not Counted	Counted
• Value of resale goods	• Value added by a used car dealer
• Sales of stocks or bonds	• Commissions paid to stock brokers
• Government transfer payments	
• Work of house-spouses	

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### Gross and Net Concepts

- Net domestic product is GDP adjusted for depreciation,
  - Depreciation** is the amount of capital used up in producing that year's GDP
  - NDP measures output available for purchase

**NDP = C + I + G + (X-M) – depreciation**

- Net Investment is gross investment minus depreciation

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### National and Domestic Concepts

- GDP is the total value of all final goods and services produced in an economy in a one-year period
  - GDP is output produced within a country's borders
- **Gross National Product (GNP)** is the aggregate final output of citizens and businesses of an economy in one year
  - GNP is output produced by a country's citizens
  - $GNP = GDP + \text{Net foreign factor income}$
- **Net foreign factor income** is the income from foreign domestic factor sources minus foreign factor income earned domestically

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### The Income Approach

- Aggregate income is the total income earned by citizens and businesses in a country in a year
- Aggregate income consists of:
  - Employee compensation
  - Rent
  - Interest
  - Profits
- $\text{Aggregate income} = \text{Employee compensation} + \text{Rents} + \text{Interest} + \text{Profits}$

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### Aggregate Income Breakdown

Country	Aggregate Income (billions)	= Employee compensation	+ Rents	+ Interest	+ Profits
U.S.	\$14,129	71%	1%	6%	22%
Japan	\$4,294	73%	2%	2%	23%
Germany	\$2,928	73%	2%	6%	19%
U.K.	\$2,213	62%	4%	3%	30%
Canada	\$1,270	68%	8%	6%	18%
Sweden	\$341	64%	4%	13%	19%

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### Equality of Income and Expenditures

- Whenever a good or service is produced (output), somebody receives an income for producing it
- **Aggregate Income  $\equiv$  Aggregate Production**
- Profit is a residual that makes the income side equal the expenditures side
- This aggregate identity allows us to calculate GDP either by adding up all values of final outputs (C, I, G, NX) or by adding up the values of all earnings or income

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### Comparing GDP Among Countries

- Per capita GDP can be used to compare relative standards of living among various countries
- Because of differences in nonmarket activities and difference in product prices, per capita GDP may be a misleading measure of living standards
- Purchasing power parity adjusts for relative price differences before making comparisons

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### Economic Welfare Over Time

- Using GDP to compare the economy's performance over time is much better than relying on perceptions
- GDP figures are affected by inflation
  - If increases in GDP are due to increases in prices, then welfare does not increase
- Changes in welfare over time are best indicated by changes in real GDP, nominal GDP adjusted for inflation

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### Real and Nominal GDP

- **Nominal GDP** is GDP calculated at existing prices
- **Real GDP** is nominal GDP adjusted for inflation
- The price index is used as the GDP deflator

$$\text{Real GDP} = \frac{\text{Nominal GDP}}{\text{GDP deflator}} \times 100$$

$$\text{GDP deflator} = \frac{\text{Nominal GDP}}{\text{Real GDP}} \times 100$$

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### Some Limitations of Aggregate Accounting

- GDP measures economic activity, not welfare
  - GDP does not measure happiness, nor does it measure economic welfare
- Measurement problems exist
  - Measurements of inflation can involve significant measurement errors
- Subcategories are often interdependent
  - For example, the line between consumption and investment may be unclear

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### Genuine Progress Indicator

- Measurement is necessary, and the GDP measurements and categories have made it possible to think and talk about the aggregate economy
- The **genuine progress indicator (GPI)** makes a variety of adjustments to GDP to better measure the progress of society rather than just economic activity
- The GPI includes social goals such as pollution reduction, education, and health

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**Chapter Summary**

- Aggregate accounting is a set of rules and definitions for measuring economic activity in the aggregate economy
- GDP is the total market value of all final goods and services produced in an economy in one year
- GDP is the sum of four expenditures:  
$$\text{GDP} = C + I + G + (X - M)$$
- Intermediate goods can be eliminated from GDP by:
  - Measuring only final sales
  - Measuring only value added

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**Chapter Summary**

- Net domestic product is GDP less depreciation
- NDP represents output available for purchase because production used to replace worn-out plant and equipment (depreciation) has been subtracted
- GDP measures output produced within the borders of a country; GNP measures the economic output produced by the citizens of a country
- Aggregate income = Compensation of employees  
+ Rent + Interest + Profit

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**Chapter Summary**

- Aggregate income equals aggregate production because whenever a good is produced somebody receives income for producing it, and profit is key to that equality
- Because GDP measures only market activities, GDP can be a poor measure of relative living standards among countries
- To compare income over time, we must adjust for price-level changes. After adjusting for inflation, nominal measures are changed to "real" measures

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### Chapter Summary

$$\text{Real GDP} = \frac{\text{Nominal GDP}}{\text{GDP deflator}} \times 100$$

- GDP has its problems:
  - GDP does not measure economic welfare
  - GDP does not include transactions in the underground economy
  - The price index used to calculate real GDP is problematic
  - Subcategories of GDP are often interdependent

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